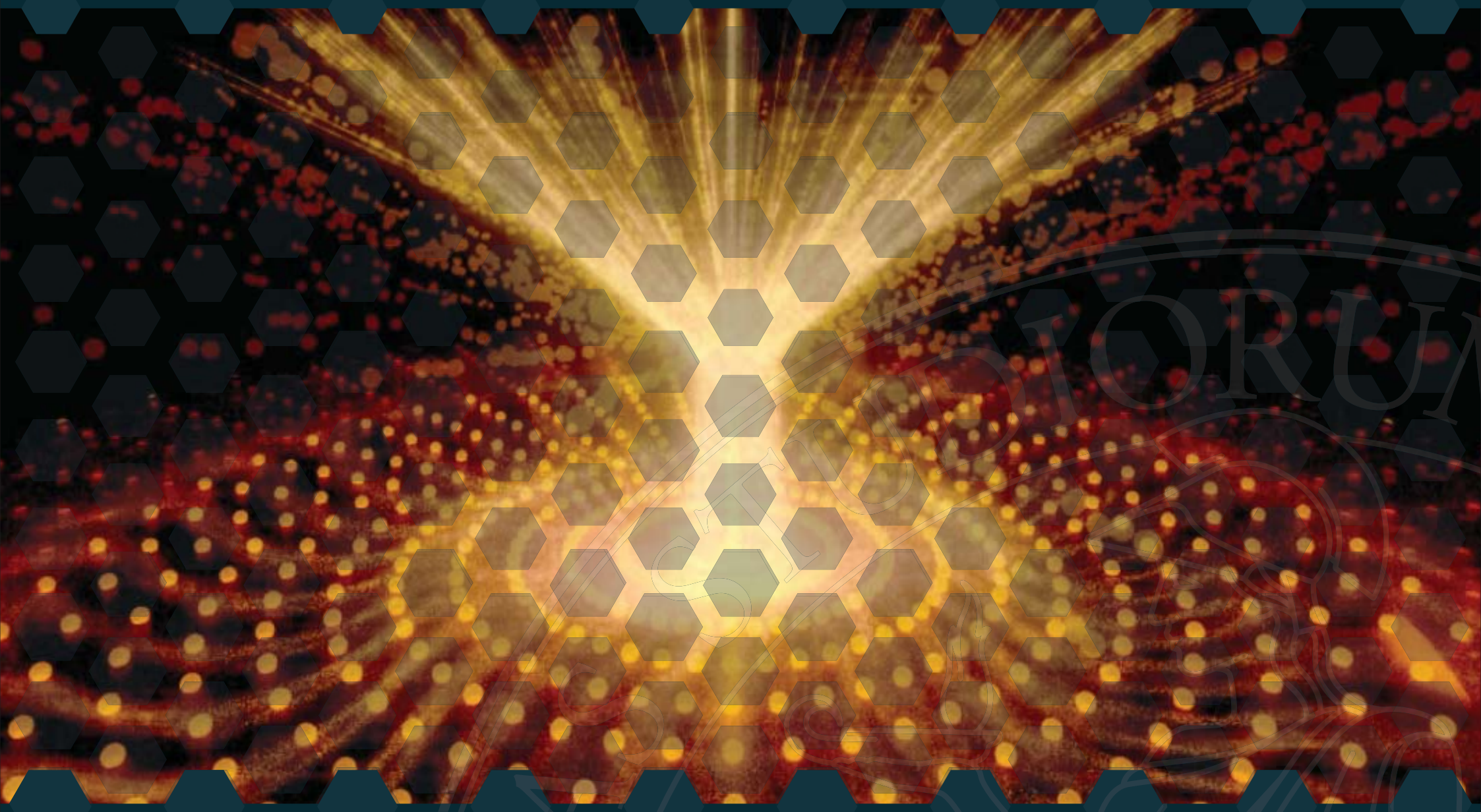
PHYSICS COLLOQUIA 2017



Controlling and probing complex quantum systems is of paramount importance for the implementation of quantum simulators, measurement-based quantum computers, and quantum-enhanced devices based on coherent transport. These technologies hold the promise to revolutionise all existing information processing and communication protocols, therefore having a profound impact on society.
The community is now working on the development of a radically new approach to probe complex quantum systems, based on the quantification and optimisation of the information which can be extracted by an immersed quantum probe as opposed to a classical one.
Researchers investigate and experimentally implement the indirect and non-destructive monitoring of quantum phase transitions, transport properties, and nonequilibrium phenomena in both ultracold environments and quantum optical systems. Time correlations, open-quantum-systems techniques and non-Markovianity play a crucial role in carrying on these lines or research.

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Quantum probes for complex systems

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UNIVERSITÀ DEGLI STUDI DI MILANO
DOTTORATO DI RICERCA IN FISICA
ASTROFISICA E FISICA APPLICATA

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